EN54-23 Open Class—Symphoni Series of Loop Powered Beacon-Sounders

INDOOR BEACON-SOUNDER

OUTDOOR BEACON-SOUNDER

Fig. 1: General View of EN54-23 Open Class—FC410LPBS Symphoni Series

Introduction

The EN54-23 Open Class—FC410LPBS Symphoni Series of Loop Powered Beacon-Sounders are designed to be driven from a FIRECLASS controller via the addressable loop.

The EN54-23 Open Class-Symphoni Series of Loop Powered Beacon-Sounders consist of:

- FC410LPBS-R: Beacon-Sounder (indoor) red housing
- FC410LPBS-W: Beacon-Sounder (indoor) white housing
- FC410LPBS LP: Beacon-Sounder IP65 (outdoor) red housing

The sounder has two volume settings:

- High (103dB ±3) or
- Low (90dB ±3).

The beacon emits a white flashing light and it has two flash rates:

- Slow Flash (½ Hz) or
- Fast Flash (1 Hz).

The EN54-23 Open Class—FC410LPBS Symphoni devices are synchronised, but not synchronous with other sounders (FC430SB/FC410SNM) and beacons (FC430SAB).

The first flash of the beacon is synchronised with the start of the tone.

The EN54-23 Open Class—FC410LPBS Symphoni devices have a built in two port isolator.

Technical Specification

Mechanical Characteristics

The overall dimensions are shown in Fig. 2. All dimensions are in mm.

Parameter	Value
Weight:	
■ Indoor Beacon-Sounder	216 g
■ Outdoor Beacon-Sounder	298 g
Materials:	
■ Housing	ABS FR or ABS/PC FR
■ Housing Colour	White 21-0302 Red 21-0301
Mounting Requirements	50 mm or 60 mm Besa box or surface mount

Table 1: Technical Specification

The indoor back box has two drill positions (on the bottom) for gland holes.

The outdoor back box has 3 drill positions (top and bottom) for gland holes.

The indoor beacon-sounder body clips onto the backbox and can only be removed by the use of a special key.

The outdoor beacon-sounder is secured to the backbox by four Allen key screws.

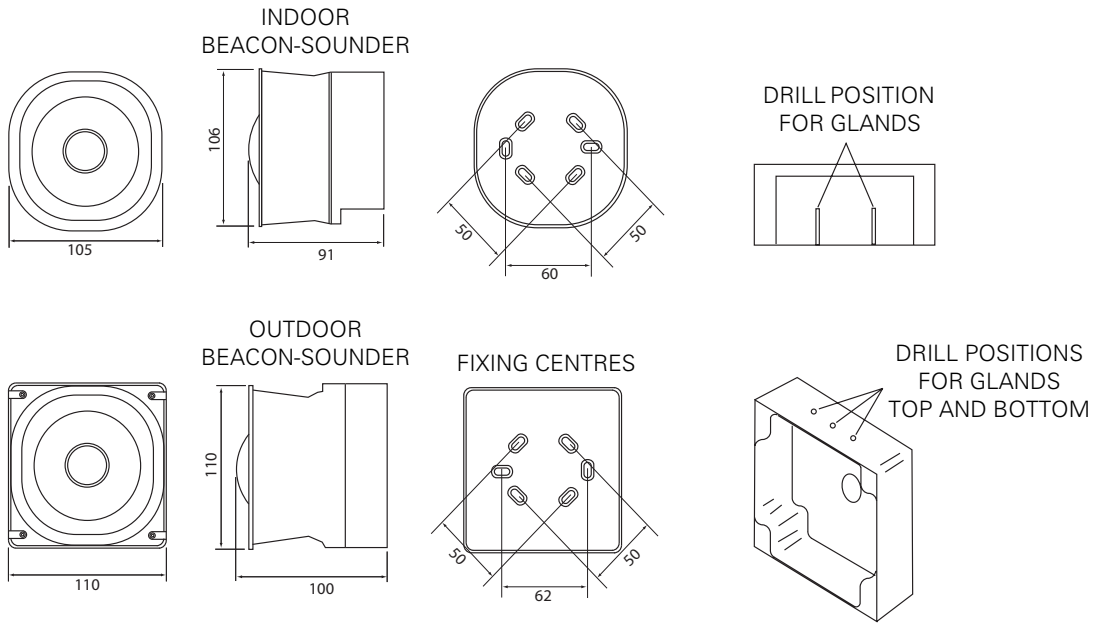

Fig. 2: Overall Fixing Dimensions—FC410LPBS Symphoni Series

Environmental Characteristics

Parameter	Value
Temperature:	
■ Operating:	
Indoor	-10°C to +55°C
Outdoor	-20°C to +70°C
■ Storage:	
Indoor	-25°C to +70°C
Outdoor	-25°C to +70°C
Humidity	Up to 95% RH (non-condensing)
Pressure	Sounder output is quoted for atmospheric pressure of 1000 mBar
Vibration	Meets the requirements of EN 54-3 and EN 54-23.
Shock	Meets the requirements of EN 54-3 and EN 54-23.
Corrosion	Passes the SO_2 corrosion test from EN 54-3 and EN 54-23.
IP Rating:	IP code to EN 60529 in wall mounted orientation:
■ Indoor	IP21C (Type A)
■ Outdoor	IP65 (EN54-3 and EN54-23 approved to IP33C Type B)

Table 2: Environmental Characteristics

Performance Characteristics

Parameter	Value
Sound Performance:	
SPL at 90° at a distance of 1m.	
High:	103 dB ±3
Low:	90 dB±3
Note: EN54-3:2001 does not test at 90°.	
Light Performance:	EN54-23 Category O:
■ Light Colour	White flashing light
■ Flash Rate:	Fast flash 1 Hz, or slow flash ½ Hz

Table 3: Performance Characteristics

EMC:

The EN54-23 Open Class—Symphoni devices comply with the following:

- Product family standard EN50130-4 in respect of:
  - Conducted Disturbances,
  - Radiated Immunity,
  - Electrostatic Discharge,
  - Fast Transients and
  - Slow High Energy.
- EN61000-6-3 for Emissions

Electrical Characteristics

Parameter	Value
Addressable Loop Voltage	20 - 40 Vdc
DC Loop Loading: ■ Quiescent ■ Alarm	 320µA See Table 5: "Alarm Current"
Isolator:	
Maximum Loop Voltage	40 Vdc
Minimum Loop Voltage	20 Vdc
Maximum Rated Continuous Current (Isolator Closed)	2A
Maximum Rated Switching Current (s/c)	2A
Maximum Leakage Current (Isolator Open)	6 mA into zone (10 mA into Isolator)
Maximum Series Impedance (Isolator Closed)	0.25 Ω
Isolator Switching Threshold (Isolator Closed to Open)	20 V or below
Isolator Switching Threshold (Isolator Open to Closed):	2.9 V to 3.5 V from s/c

Table 4: Electrical Characteristics

Alarm Current

Parameter	Low	High	Unit
Sound Output	90	103	dB
Sounder Only	3.15	8.65	mA
Sounder and Beacon 0.5 Hz	8.73	14.2	mA
Sounder and Beacon 1 Hz	9.8	15.3	mA

Table 5: Alarm Current

Sounder Tones

Table 6 details the tones available for selection in FIRECLASS Express.

NOTICE: Bell Tone

This is a simulated bell tone with a limited bandwidth. It is not advisable to mix conventional bells and electronic sounders producing a simulated bell tone.

Approved Tones

Tables 7 to 12 detail the tones approved by LPCB to the specification shown. The data applies to both horizontal and vertical planes.

Device Mode	Name	Tone Description			Monitored (High 103 dB and Low 90 dB No pulsing in FIRECLASS Express)	Monitored with Pulse Pattern Assigned in FIRECLASS Express
		Pattern	Frequency (Hz)	Rate		
1	Dutch Slow Whoop	Sweep	500 to 1200	500 Hz rising to 1200 Hz over 3.5 s silence 0.5 s repeat	Yes	No
2	7 Hz Fast Sweep	Sweep	800 to 970	0.1428 s ramp 7 Hz	Yes	No
3	BS 1 Hz Sweep	Sweep	800 to 970	1H z	Yes	No
4	2 Tone	Alternating	660/880	500 ms per tone	Yes	No
5	Temporal 4	Intermittent	880	500 ms on 500 ms off x 4 followed by 1.5 s silence	Yes	No
6	Temporal 3	Intermittent	880	500 ms on 500 ms off x 3 followed by 1.5 s silence	Yes	No
7	March Time Beep	Intermittent	880	500 ms - on 500 ms - off	Yes	No
8	Continuous 970	Continuous	970	Steady	Yes	No
9	Continuous 850	Continuous	850	Steady	Yes	No
10	DIN 1 Hz Sweep	Sweep	1200 to 500	1200 Hz falling to 500 Hz over 1s and repeat	Yes	No
11	Banshee LF Buzzer	Sweep	800 to 950	120 Hz	Yes	No
12	3 Hz Banshee Fast Sweep	Sweep	800 to 950	3 Hz	Yes	No
13	9 Hz Banshee Fast Sweep	Sweep	800 to 950	9 Hz	Yes	No
14	Alternating	Alternating	554/440	554 Hz for 100 ms and 440 Hz for 400 ms	Yes	No
15	Yodalarm	Alternating	800 / 1000	250 ms for each frequency	Yes	No
16	Conventional Bell (Note1)	Continuous	1450	Steady	Yes	No

Table 6: Sounder Tones

Operational Performance Maximum Volume dB(A)		
Angle	**40 V**	**20 V**
15°	83	82
45°	92	91
75°	95	94
105°	95	93
135°	92	91
165°	81	80

Table 7: Continuous 850 Hz

Operational Performance Maximum Volume dB(A)		
Angle	**40 V**	**20 V**
15°	84	83
45°	94	93
75°	96	95
105°	96	94
135°	93	92
165°	83	83

Table 8: Dutch Slow Whoop 500Hz to 1200 Hz

Operational Performance Maximum Volume dB(A)		
Angle	**40V**	**20V**
15°	83	82
45°	93	92
75°	96	95
105°	95	94
135°	92	92
165°	83	82

Table 9: 7 Hz Fast Sweep

Operational Performance Maximum Volume dB(A)		
Angle	**40 V**	**20 V**
15°	80	78
45°	91	90
75°	94	93
105°	93	92
135°	91	89
165°	80	79

Table 10: Temporal 3 880 Hz

Operational Performance Maximum Volume dB(A)		
Angle	**40 V**	**20 V**
15°	88	87
45°	92	92
75°	97	95
105°	99	97
135°	95	94
165°	87	86

Table 11: DIN 1 Hz Sweep - High Volume

Operational Performance Maximum Volume dB(A)		
Angle	**40 V**	**20 V**
15°	78	77
45°	83	82
75°	88	87
105°	90	89
135°	86	85
165°	77	76

Table 12: DIN 1Hz Sweep - Low Volume

Beacon Information

Category O - open class device (see Table 13 and Fig. 3). The data applies to both the Slow Flash (1/2 Hz) and the Fast Flash (1 Hz).

The light distribution is cylindrically symmetrical about an axis at a right angle (Alpha of 90°) to the surface on which the device is mounted, i.e. when the device is mounted on a vertical wall, the light distribution is symmetrical about an axis extending horizontally through the centre of the device's domed lens. The light distribution in Fig. 3 represents a cross-section through the volumetric shape using the values as indicated in Table 13.

Alpha [degrees]	Distance [metres]
90	3
75	3.1
60	3.15
45	2.15
30	1.95
15	0.75
0	0

Table 13: FC410LPBS Symphoni Series—0.4 lm/m^2 Illumination Distance

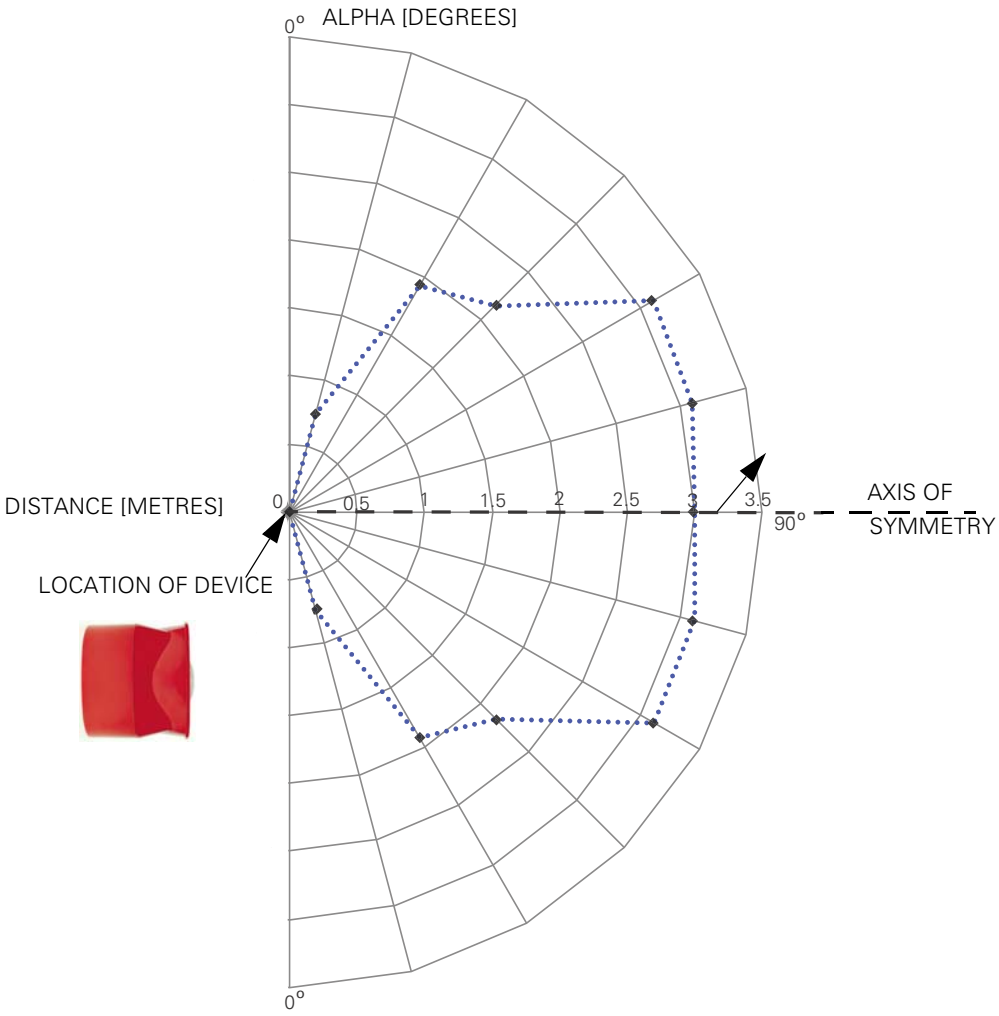

Fig. 3: FC410LPBS Symphoni Series—Graphical Illustration of Wall Mount Light Distribution

Address Programming

Fig. 4: EN54-23 Open Class—Symphoni Programming Port
1– Programming Port

The default factory address is set to 255. The device should be programmed with its loop address before installation using an FC490ST with an ancillary lead that plugs into the device's programming port (see Fig. 4).

The EN54-23 Open Class—FC410LPBS Symphoni Series Beacon-Sounder uses 2 consecutive addresses on the addressable loop, starting from the chosen programmed address number. These addresses are automatically generated when a Symphoni Beacon-Sounder is selected in FIRECLASS Express.

The address configuration is as follows:

Address	Type
n	Sounder Device
n+1	Beacon Device

Table 14: Address Configuration

Symphoni Configuration

The Sounder tone (Device Mode), sounder volume output (Sensitivity) and beacon flash rate (Device Mode) are configured in FIRECLASS Express.

NOTICE: Tone Setting
It is not possible to select different tones for different Symphoni devices connected to the FIRECLASS panel.

For system loading, refer to Publication FC-D-LOOP-PI System Loading Guidelines.

Bell Mapping

If it is required for the sounder to operate as a Bell Map output, then the Group to which the device belongs must be put into the Bell Map Outputs Supergroup.

To achieve this, select group 50 Bell Map Output SG and then select "Edit Members". Use "Add member" to include the Points group into the Bell Map Output SG.

If the sounder base needs including in any sounder Walk Test, then super group number 51 "Sounders to walktest SG", will have to be edited to add the point's group to the list of supergroup members.

For the beacon to be included as a visual output controlled by the Bell Map, the points group needs to be included in 'Bell Map Visuals SG', 58.

Output Pulse Pattern

Output pulse patterns are restricted such that the period between every High to Low transition and the following Low to High transition is a multiple of 2 seconds. Pulse patterns are also restricted to continuous tone patterns only.

Fault Monitoring

Both the sounder and beacon are monitored. The last 2 columns of Table 6, "Sounder Tones" on page 3 define if the sounder is monitored, as a function of volume setting and system configuration. Sounder Monitoring is also referred to as Reflective Sound Monitoring (RSM). For further details on the application of this function, refer to the Technical Publications of the relevant Control and Indicating equipment.

Isolator Operation

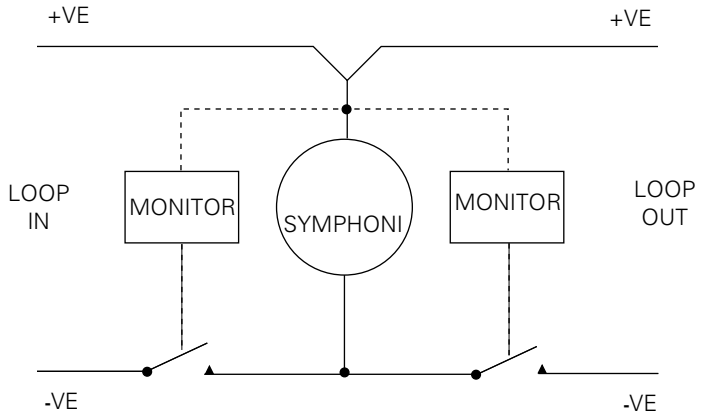

Fig. 5: Simplified Isolator Diagram

The built-in isolator serves as a protection device against short circuits. It operates by isolating the section of line containing the short circuit from devices on the line and from the rest of the line (refer to Fig. 5). Optimum operation requires the line to be wired as a loop, so that a section of line with a short circuit can be isolated between a pair of isolator devices (including Symphoni devices).

In order to enable the isolator's use in a looped circuit, it is capable of passing current in both directions:

- Loop IN to Loop OUT or
- Loop OUT to Loop IN.

In the event of a line short circuit, the line isolator continues to power its associated Beacon-Sounder, providing that either Loop IN or Loop OUT remains intact. When a short circuit develops, the adjacent isolator devices will isolate both sides of the loop from the faulty device/cable.

The operation of the loop driver means that there are effectively 2 operational modes for the built-in isolator.

- When the loop is first powered, if a section of the line appears as a low impedance (with an equivalent resistance of <400 Ω), the isolator will restrict the power to that section of line until the fault is cleared.
- If a short circuit is introduced onto the line when the loop is already powered up, in most instances the controller's internal protection will switch in before the line isolator. The voltage is then removed from the line by the controller, on restoration, the isolator devices will isolate the low impedance section of the line.

Cabling

Cables should be selected in accordance with local standards. Cabling should be connected as shown in Fig. 6, ensuring correct polarity.

Each terminal connection will accept wire size up to 2.5 mm^2 (MICC or similar).

NOTICE: Cabling Requirement

Couplers are to be used with MICC cable.

Suitable glands must be used with the outdoor device to keep the IP65 rating.

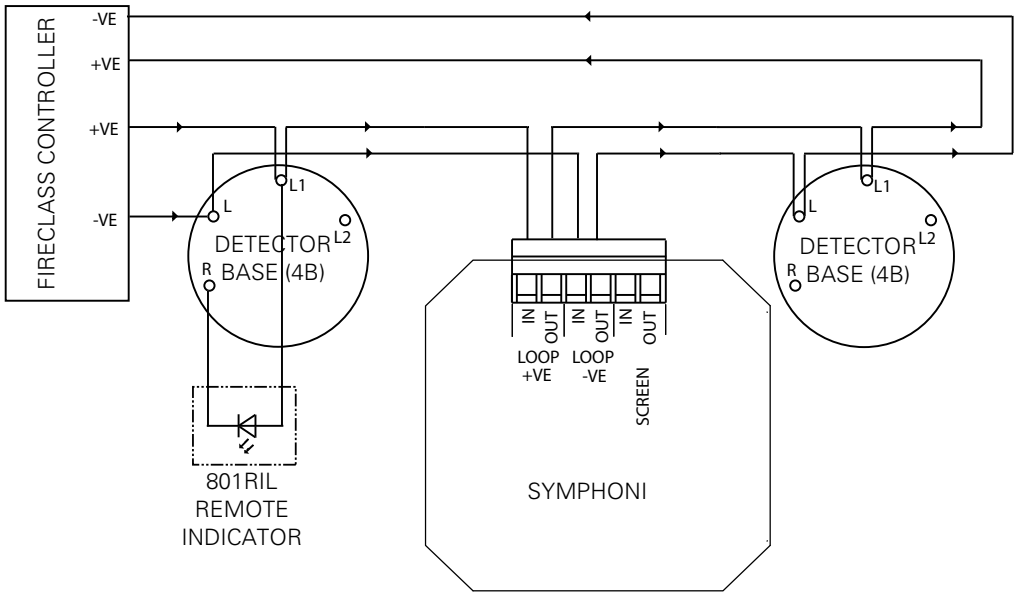

Fig. 6: Simplified Wiring Diagram

CPR Information

CE

0832

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Fire alarm device – Sounder and Visual alarm device (VAD) with short circuit isolator for use in fire detection and fire alarm systems installed in and around buildings

516.800.970 FC410LPBS-R Type A DoP-2014-2006
516.800.971 FC410LPBS-W Type A DoP-2014-2007
516.800.972 FC410LPBS LP Type B DoP-2014-2008

Essential Characteristics

EN54-3: 2001 + A1:2002 + A2:2006

Performance under fire condition: Pass
Operational reliability: Pass

Durability:
Temperature resistance: Pass
Humidity resistance: Pass
Corrosion resistance: Pass
Shock and vibration resistance: Pass
Electrical stability: Pass
Resistance to ingress: Pass

EN54-17:2005

Performance under fire conditions: Pass
Operational reliability: Pass

Durability:
Temperature resistance: Pass
Vibration resistance: Pass
Humidity resistance: Pass
Corrosion resistance: Pass
Electrical stability: Pass

EN54-23: 2010

Duration of operation: Pass
Provision for external conductors: Pass
Flammability of materials: Pass
Enclosure protection: Pass
Access: Pass
Manufacturer's adjustments: Pass
On-site adjustment of behaviour: Pass
Requirements for software controlled devices: Pass
Coverage volume: Pass
Variation of light output: Pass
Minimum and maximum light intensity: Pass
Light colour: White
Light temporal pattern / frequency of flashing: Pass / 0.5Hz and 1Hz
Marking and data: Pass
Synchronization: Pass

Durability:
Temperature resistance: Pass
Humidity resistance: Pass
Shock and vibration resistance: Pass
Corrosion resistance: Pass
Electrical stability: Pass

Fig. 7: CPR Information

Order Information

Product	Order Code
EN54-23—FC410LPBS-R Beacon-Sounder (indoor use) - red housing	516.800.970
EN54-23—FC410LPBS-W Beacon-Sounder (indoor use) - white housing	516.800.971
EN54-23—FC410LPBS LP Beacon-Sounder IP65 (outdoor use) - red housing	516.800.972

Table 15: Order Information

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www.fireclass.co.uk
FC-D-SYMOC-PI, doc. version 3, 18. November 2014
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